

THE CLAIMS:

1. (Previously Presented) A nitride semiconductor device comprising a p-type nitride semiconductor layer, an n-type nitride semiconductor layer, an active layer interposed between the p-type nitride semiconductor layer and the n-type nitride semiconductor layer, a non-doped nitride semiconductor layer containing Al, and a non-doped GaN layer, wherein,

the p-type nitride semiconductor layer includes:

a first p-type nitride semiconductor layer containing Al and Mg; and
a second p-type nitride semiconductor layer containing Mg,

the first p-type nitride semiconductor layer being located between the active layer and the second p-type nitride semiconductor layer, and

the second p-type nitride semiconductor layer having a greater band gap than a band gap of the first p-type nitride semiconductor layer,

wherein the first p-type nitride semiconductor layer is in contact with the second p-type nitride semiconductor layer,

the non-doped nitride semiconductor layer is located between the first p-type nitride semiconductor layer and the active layer, and is in contact with the first p-type nitride semiconductor layer,

the non-doped GaN layer is located between the non-doped nitride semiconductor layer and the active layer and is in contact with the non-doped nitride semiconductor layer, and

the active layer has a plurality of GaInN layers, and has no intentional doped impurity.

2. (Original) The nitride semiconductor device of claim 1, wherein the second p-type nitride semiconductor layer functions as a barrier layer for suppressing a carrier overflow from the active layer.

3. (Withdrawn) The nitride semiconductor device of claim 1, wherein, the first p-type nitride semiconductor layer has an Al concentration of no less than $1\times10^{20}\text{cm}^{-3}$ and no more than $2\times10^{21}\text{cm}^{-3}$ and a region of the first p-type nitride semiconductor layer in which the Al concentration is no less than $1\times10^{20}\text{cm}^{-3}$ and no more than $2\times10^{21}\text{cm}^{-3}$ has a thickness of 1 nm or more.

4. (Canceled)

5. (Original) The nitride semiconductor device of claim 4, wherein the non-doped nitride semiconductor layer has a smaller band gap than a band gap of the second p-type nitride semiconductor layer.

6. (Original) The nitride semiconductor device of claim 5, wherein the non-doped nitride semiconductor layer has a band gap equal to the band gap of the first p-type nitride semiconductor layer.

7. (Withdrawn) The nitride semiconductor device of claim 4, wherein a total thickness of the non-doped nitride semiconductor layer and the first p-type nitride semiconductor layer is no less than 1 nm and no more than 50 nm.

8. (Withdrawn) The nitride semiconductor device of claim 7, wherein the second p-type nitride semiconductor layer has a thickness of no less than 5 nm and no more than 20 nm.

9. (Withdrawn) The nitride semiconductor device of claim 8, wherein a region of the second p-type nitride semiconductor layer which has an Mg concentration of $8\times10^{18}\text{cm}^{-3}$ or less has a thickness of 1 nm or less.

10. (Withdrawn) The nitride semiconductor device of claim 1, wherein, the p-type nitride semiconductor layer further includes a third p-type nitride

semiconductor layer having a smaller band gap than a band gap of the second p-type nitride semiconductor layer; and

the second p-type nitride semiconductor layer is located between the third p-type nitride semiconductor layer and the first p-type nitride semiconductor layer.

11. (Withdrawn) The nitride semiconductor device of claim 10, wherein the third p-type nitride semiconductor layer has a smaller band gap than the band gap of the first p-type nitride semiconductor layer.

12. (Withdrawn) The nitride semiconductor device of claim 10, wherein the third p-type nitride semiconductor layer functions as a cladding layer.

13. (Withdrawn) The nitride semiconductor device of claim 10, wherein at least one of the first p-type nitride semiconductor layer and the second p-type nitride semiconductor layer contains In.

14. (Withdrawn) The nitride semiconductor device of claim 13, wherein the second p-type nitride semiconductor layer has a greater In mole fraction than an In mole fraction of the first p-type nitride semiconductor layer.

15. (Previously Presented) A production method for a nitride semiconductor device including a p-type nitride semiconductor layer, an n-type nitride semiconductor layer, and an active layer interposed between the p-type nitride semiconductor layer and the n-type nitride semiconductor layer, a non-doped nitride semiconductor layer containing Al, and a non-doped GaN layer, wherein: the p-type nitride semiconductor layer includes a first p-type nitride semiconductor layer containing Al and Mg and a second p-type nitride semiconductor layer containing Mg; the first p-type nitride semiconductor layer is located between the active layer and the second p-type nitride semiconductor layer; and the second p-type nitride semiconductor layer has a greater

band gap than a band gap of the first p-type nitride semiconductor layer, the production method comprising:

- a step of forming the n-type nitride semiconductor layer;
- a step of forming the active layer which has a plurality of GaInN layers, and has no intentional doped impurity;
- a step of forming the non-doped GaN layer;
- a step of forming the non-doped nitride semiconductor layer on the non-doped GaN layer;
- a step of forming the first p-type nitride semiconductor layer containing Al and Mg on the non-doped nitride semiconductor layer by supplying both a source gas having Mg and a source gas having Al; and
- a step of forming the second p-type nitride semiconductor layer on the first p-type nitride semiconductor layer by supplying a source gas having Mg.

16. (Previously Presented) The production method of claim 15 wherein the step of forming the non-doped nitride semiconductor layer is performed by supplying a source gas having Al without supplying any p-type impurities.

17. (Withdrawn) The production method of claim 15, wherein,
the first p-type nitride semiconductor layer has an Al concentration of no less than $1\times10^{20}\text{cm}^{-3}$ and no more than $2\times10^{21}\text{cm}^{-3}$ and
a region of the first p-type nitride semiconductor layer in which the Al concentration is no less than $1\times10^{20}\text{cm}^{-3}$ and no more than $2\times10^{21}\text{cm}^{-3}$ has a thickness of 1 nm or more.